

WHAT IS CLAIMED IS:

1. A wireless data transmitting and receiving system comprising:
 - a random number generator which generates a random number sequence;
 - a random-interval pulse sequence generator which generates a random-interval pulse sequence of data, which is to be transmitted, using the random number sequence generated by the random number generator;
 - a template pulse sequence generator which generates a reference template pulse sequence used to detect a start point of the random-interval pulse sequence and generates pulse sequences for a signal 0 and a signal 1 by changing widths of pulses;
 - a random number sequence detector which receives the random-interval pulse sequence and detects information regarding a start point of a random number sequence, which is used to make the received random-interval pulse sequence, using the reference template pulse sequence; and
 - a comparator which compares the pulse sequences for the signal 0 and the signal 1 based on the start point information regarding the random number sequence with the received random-interval pulse sequence, and determines whether the value of the received random-interval pulse sequence is 0 or 1.
2. The system of claim 1, wherein the random-interval pulse

sequence is generated at an Ultra Wide Band (UWB).

3. The system of claim 1, wherein the random-interval pulse sequence generator generates the random-interval pulse sequence using pulse position modulation.

4. The system of claim 1, wherein the template pulse sequence generator generates the reference template pulse sequence based on information regarding the same random number sequence as a transmitter uses to generate the random-interval pulse sequence.

5. The system of claim 1, wherein the random number sequence detector detects the start point information regarding the random number sequence by checking a degree of which an energy distribution of a spectrum of the received random-interval pulse sequence matches an energy distribution of a spectrum of the reference template pulse sequence, which is generated by the template pulse sequence generator, and determining whether the degree of match exceeds a predetermined critical value.

6. The system of claim 1, wherein the template pulse sequence generator generates the pulse sequences such that each pulse of the pulse

sequence corresponding to the signal 0 is out of phase with each pulse of the pulse sequence corresponding to the signal 1 by a predetermined degree.

7. The system of claim 1, wherein the template pulse sequence generator generates reference pulse sequences by adjusting the widths of the pulses of the pulse sequence for the signal 0 to be different from the widths of the pulses of the pulse sequence for the signal 1 to a predetermined degree, so as to distinguish between 0's and 1's in the reference pulse sequences.

8. A wireless data receiving apparatus comprising:

- a template pulse sequence generator which generates a reference template pulse sequence used to detect a start point of a received random-interval pulse sequence and generates a pulse sequence for a signal 0 and a pulse sequence for a signal 1 by differently adjusting widths of pulses;
- a random number sequence detector which receives the random-interval pulse sequence and detects information regarding a start point of a random number sequence used to generate the random-interval pulse sequence; and
- a comparator which compares the received random-interval pulse sequence with the pulse sequences for the signal 0 and the signal 1, which are generated by the template pulse sequence generator, based on the start point information detected by the random number sequence detector and determines

whether a value of the received random-interval pulse sequence is 0 or 1.

9. The apparatus of claim 8, wherein the received random-interval pulse sequence is generated at a UWB.

10. The apparatus of claim 8, wherein the template pulse sequence generator generates the pulse sequences such that each pulse of the pulse sequence for the signal 0 is out of phase with each pulse of the pulse sequence for the signal 1 by a predetermined degree.

11. The apparatus of claim 8, wherein the template pulse sequence generator generates reference pulse sequences by adjusting a pulse width for the signal 0 to be different from a pulse width for the signal 1 to a predetermined degree, so as to distinguish between 0's and 1's in the reference pulse sequences.

12. A UWB pulse sequence generation apparatus comprising:
a first pulse sequence generator which generates a first UWB pulse sequence using a predetermined random number sequence; and
a second pulse sequence generator which generates a second UWB

pulse sequence that is out of phase to the first UWB pulse sequence by a predetermined degree.

13. The apparatus of claim 12, wherein the phase of each pulse of the pulse sequence for the signal 0 and the phase of each pulse of the pulse sequence for the signal 1 are set to be different from each other, using a BiPhase Shifting Keying (BPSK) method or a Quadrature Phase Shift Keying (QPSK) method.

14. A UWB pulse sequence generator comprising:
a first pulse sequence generator which generates a first UWB pulse sequence using a predetermined random number sequence; and
a second pulse generator which generates a second UWB pulse sequence whose pulse width is wider than the pulse width of the first UWB pulse sequence by a predetermined degree.

15. A wireless data transmitting/receiving method comprising:
(a) generating a random number sequence;
(b) generating a random-interval pulse sequence for data, which is to be transmitted, using the random number sequence;

(c) generating a reference template pulse sequence used to detect a start point of the received random-interval pulse sequence;

(d) receiving the random-interval pulse sequence and detecting information regarding a start point of a random number sequence used to generate the received random-interval pulse sequence, using the reference template pulse sequence;

(e) generating reference pulse sequences for a signal 0 and a signal 1 based on the start point information regarding the random number sequence; and

(f) comparing the reference pulse sequences for the signal 0 and the signal 1 with the received random-interval pulse sequence and determining whether the value of the received random-interval pulse sequence is 0 or 1 based on the result of comparison.

16. The method of claim 15, wherein the random-interval pulse sequence is generated at a UWB.

17. The method of claim 15, wherein during (b), the random-interval pulse sequence is generated using pulse position modulation.

18. The method of claim 15, wherein during (c), the reference

template pulse sequence is generated based on information regarding the same random number sequence as a transmitter uses to generate the random-interval pulse sequence.

19. The method of claim 15, wherein during (d), the start point information is detected by checking a degree of which an energy distribution of a spectrum of the received random-interval pulse sequence matches an energy distribution of a spectrum of the reference template pulse sequence and determining whether the degree of match exceeds a predetermined critical value.

20. The method of claim 15, wherein during (e), the reference pulse sequences are generated such that each pulse of the pulse sequence for the signal 0 is out of phase with each pulse of the pulse sequence for the signal 1 by a predetermined degree.

21. The method of claim 15, wherein during (e), the reference pulse sequences are generated such that a width of each pulse of the pulse sequence for the signal 0 is adjusted to be different from a width of each pulse of the pulse sequence for the signal 1 to a predetermined degree, so as to distinguish between 0's and 1's in the reference pulse sequences.

22. A wireless data receiving method comprising:

- (a) generating a reference template pulse sequence used to detect a start point of a received random-interval pulse sequence;
- (b) receiving the random-interval pulse sequence and detecting information regarding a start point of a random number sequence used to generate the received random-interval pulse sequence using the reference template pulse sequence;
- (c) generating reference pulse sequences for a signal 0 and a signal 1 based on the start point information regarding the random number sequence; and
- (d) comparing the reference pulse sequences for the signal 0 and the signal 1 with the received random-interval pulse sequence and determining whether a value of the received random-interval pulse sequence is 0 or 1.

23. The method of claim 22, wherein the random-interval pulse sequence is generated at a UWB.

24. The method of claim 22, wherein during (c), the reference pulse sequences are generated such that each pulse of the pulse sequence for the signal 0 is out of phase with each pulse of the pulse sequence for the signal 1

by a predetermine degree.

25. The method of claim 22, wherein during (c), the reference pulse sequences are generated such that widths of pulses of the pulse sequence for the signal 0 are different from widths of pulses of the pulse sequence for the signal 1 to a predetermined degree, so as to distinguish between 0's and 1's in the reference pulse sequences.

26. A UWB pulse sequence generation method comprising:

- (a) generating a first UWB pulse sequence using a predetermined random number sequence; and
- (b) generating a second UWB pulse sequence to be out of phase with the first UWB pulse sequence.

27. The method of claim 26, wherein a phase of the first UWB pulse sequence and a phase of the second UWB pulse sequence are set to be different from each other, using BPSK or QPSK.

28. A UWB pulse sequence generation method comprising:

- (a) generating a first UWB pulse sequence using a predetermined

random number sequence; and

(b) generating a second UWB pulse sequence whose pulse width is wider than a pulse width of the first UWB pulse sequence by a predetermined degree.

29. A computer readable recording medium for recording a program which executes a UWB pulse sequence generation method, wherein the method comprises:

(a) generating a first UWB pulse sequence using a predetermined random number sequence; and

(b) generating a second UWB pulse sequence which is out of phase with the first UWB pulse sequence by a predetermined degree.

30. A computer readable recording medium for recording a program which executes a UWB pulse sequence generation method, wherein the method comprises:

(a) generating a first UWB pulse sequence using a predetermined random number sequence; and

(b) generating a second UWB pulse sequence whose pulse width is wider than a pulse width of the first UWB pulse sequence by a predetermined degree.